

Obesity & Its Associated Risk Factors

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Obesity

Obesity is a condition in which a person has excess of body fat that could impair health. Obesity increases an individual's risk for various diseases, disabilities, and death. A paper published in *Circulation* in 2012, states that "The first law of thermodynamics assures that body weight cannot change if, over a specified time, energy intake and energy expenditure are equal" and hence obesity occurs due to this imbalance of energy between calories consumed and calories expended. Obesity has, in the recent years become a global phenomenon. This has serious implications, particularly in countries like India, where one-fourth of the population is diabetic.

Childhood obesity too has raised grave concerns worldwide as obese children are predisposed to certain health conditions like Type 2 diabetes and cardiovascular diseases.

The obesity facts worldwide are startling

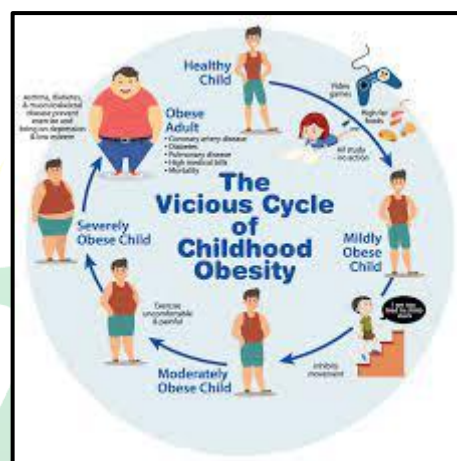
As of 2014, there were about 2.1 billion people in the world who were overweight and a sub sect 600 million) who suffer from obesity. 155 million children are overweight and 41 million children under the age of 5 are obese. In countries like India and other developing countries where under nutrition and obesity coexist, the latter causes more deaths. Obesity has nearly doubled since 1980. A large proportion of the world population is overweight. The most acceptable definition of the terms overweight and obesity has been given by The National Institute of Health.

"The terms "overweight" and "obesity" refer to body weight that's greater than what is considered healthy for a certain height". Fat is a great source of reserve energy for the body. It also acts as an insulator. It is fat that gives the body its smooth contour and its beautiful look. A normal person has about 30 to 35 billion fat cells. Initially, when a person gains weight, the fat cells grow in their size but later on, if the weight is not controlled the number of fat cells start increasing. Weight loss results in decrease in size of the cells and not

their number. The normal fat cells are 0.4 to 0.6 microgram in weight; the cells of an obese person can weigh as much as 1.2 micrograms. Genetics, family history, sex and age determine the 'size' of the individual. The rate at which a person metabolizes food and his Basal Metabolic Rate (BMR) is determined by his genetic factors. Physical inactivity, changes in food habits and lifestyle has been a major reason for the obesity epidemic worldwide. Obesity has been increasing in low and middle-income countries, as well, where it is more prevalent in the wealthy society. In fully developed countries it is more common in lower-socioeconomic groups. A conscious effort to alter diet habits and a changed lifestyle are the best methods to manage obesity. For the morbidly obese, prescription pills, non-invasive treatments and weight loss surgeries are also available.

What are the Causes of Obesity?

- Consumption of high calorific foods like saturated and trans fats and sugars.
- Addiction to television and other hand-held devices that cause a sedentary lifestyle.
- Mid-life weight gain; Older people are at a greater risk of weight gain compared to younger individuals; especially older women who are in their menopausal age.
- Illnesses like hypothyroidism (underactive thyroid), Cushing's syndrome (increase in the levels of the stress hormone, cortisol) and polycystic ovarian syndrome (PCOS) (occurring in 5-10% of women of child-bearing age) have been linked to obesity.
- Usage of Drugs like steroids, oral contraceptives, antidepressants, antiepileptics, antihypertensives and insulin is commonly followed by weight gain.
- Heredity: Obesity tends to run in families. A clearer role of genetics helps in prevention of obesity for those who are most vulnerable. Eighty percent of the offspring of two obese parents become obese.



What are the Symptoms of Obesity?

The patient's appearance and gait are sufficient to arrive at a diagnosis in most cases. Adolescents may experience different symptoms from adults.

The following are the most common symptoms that indicate an adolescent is obese.

- Large body frame
- Difficulty in doing daily activities
- Lethargy
- Breathlessness
- Disproportionate facial features
- Breast region adiposity - (sagging fat cells) in boys
- Big belly (abdomen), sometimes marked with white or purple blemishes
- Male external genitalia may appear disproportionately small
- Flabby fat in the upper arms and thighs
- Knock-knees (Genu valgum) is common

The symptoms of obesity may resemble other medical problems or conditions. Psychological disturbances are also very common as well as stress, social pressure and doing developmental chores. Always consult your doctor for a diagnosis.

How can we Diagnose Obesity?

1. Body Mass Index (BMI)

Degree of overweight or obesity can be assessed by measuring height and weight of the individual and thereby calculating BMI. BMI is defined as a person's weight in kilograms divided by the square of his height in meters (kg/m²).

Reference numbers for BMI:

Measured	Value
Normal weight	18.5 -24.9
Overweight	25.0 - 29.9
Obese	30.0 - 39.9
Extreme obesity	40.0 and above

Hence, adults with a BMI of 25 and more are considered overweight while those with a BMI of 30 or higher are considered obese. Since children and teens are constantly growing, a particular child's BMI has to be calculated against a reference growth chart made for children of the same gender and the same age group. This is called a BMI-for-age percentile.

Reference numbers for BMI-for-age percentile:

Measured	Value
Underweight	Less than 5th percentile
Healthy weight	5th percentile to less than the 85th percentile
Risk of overweight	85th percentile to less than the 95th percentile
Overweight	95th percentile or greater

Hence, for children and teens of the same age and sex, overweight is defined as a BMI at or above the 85th percentile and below the 95th percentile and obesity is defined as a BMI at or above the 95th percentile.

2. Waist Circumference

A waist size greater than 35 inches for women and greater than 40 inches for men is another way to diagnose obesity. A higher waist size puts them at an increased risk for coronary heart disease and Type 2 diabetes.

What are the Complications of Obesity?

Besides physical discomfort, an obese individual is at a risk of developing diseases such as diabetes, hypertension, cardiovascular diseases, depression, sleep apnea, fatty liver disease, gall bladder disease, osteoarthritis and fertility-related problems.

- ✚ **Coronary Heart Disease** -Build-up of plaque in the arteries supplying oxygen-rich blood to the heart. Decreased blood flow causes pain and heart attacks.
- ✚ **Heart failure** - Heart is unable to pump adequate blood for circulation. A Johns Hopkins University study puts severe obesity as an independent or a stand-alone risk factor for acquiring heart failure
- ✚ **High Blood Pressure** - Pressure inside the arteries serving oxygenated blood is highbreathing habits that results.
- ✚ **Diabetes Mellitus** - Obese people are 40 times more likely to get Type 2 Diabetes.
- ✚ **Stroke** - Poor blood flow to the brain caused by a blood clot.
- ✚ **Body Fat Abnormality** - Excess of triglycerides and bad cholesterol and lesser amounts of good cholesterol.

Metabolic Syndrome - Having 3 of the following risk factors increases the chances of having a heart disease, diabetes or stroke.

- An abnormal waistline
- Lower than normal good cholesterol
- Higher than normal triglycerides
- Higher than normal blood pressure
- Higher than normal fasting blood sugar

Osteoarthritis - A joint problem of the knees and hips aggravated by obesity.

Sleep Apnea or breathing pauses while sleeping due to excess fat around the neck.

Cancer of the colon, breast, endometrial and gall bladder.

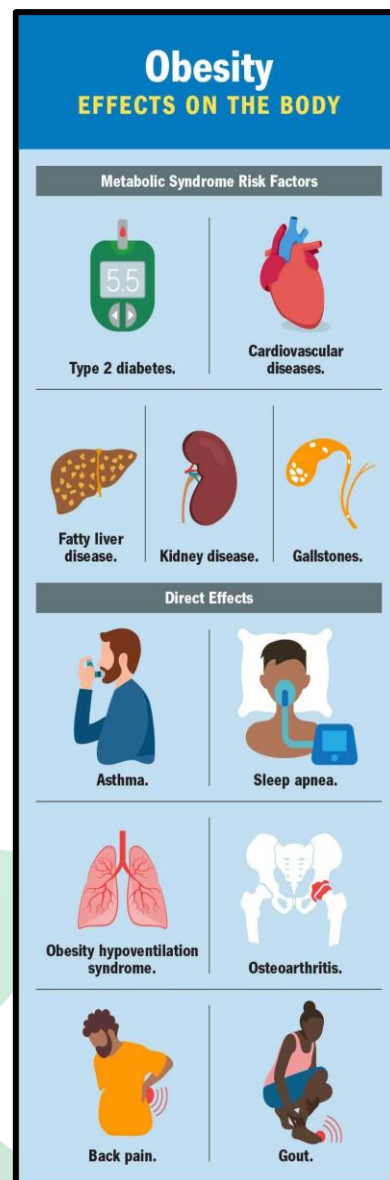
Menstrual issues and infertility in women.

Obesity hypoventilation syndrome - Some obese people tend to have poor breathing habits that result in increased carbon dioxide blood levels (hypoventilation) and decreased oxygen blood levels (hypoxemia).

Obese children are more prone to getting Type 2 diabetes and end up becoming obese adults with all of the above risks.

How is Obesity Treated?

- **Weight Reduction** - A realistic goal for adults is to reduce about 5 - 10 % of body weight over 6 months.
- **Reduce Intake of Calories** - Proposed limits are 1000 - 1200 calories for a woman and 1200 - 1600 calories for a man per day. Eating small frequent meals, and reducing portion sizes are other ways to reduce calories.
- Moderate but regular aerobic exercises such as walking, swimming, gardening and dancing provided it does not exceed their cardiovascular capacity as well as muscle strengthening, bone strengthening and stretching.



- **Eating healthy** - A meal that is high in fibre and low in saturated and trans-fat, cholesterol, sodium and added sugar especially high fructose corn syrup.
- Weight-loss medicines are used if it is not possible to lose 1 pound per week after 6 months of lifestyle changes. They have to be taken along with other methods like diet and exercise. Doctors have to monitor the person continuously while taking weight-loss medications.
- Orlistat (Xenical and Alli) are FDA approved drugs that reduce the absorption of fats, and vitamins A, D, E, and K to promote weight loss. With Xenical, the weight loss that usually occurs within the first 6 months of taking the drug is around 5 -10 pounds.
- Two FDA approved medicines for chronic weight management of adults having a BMI of 30 or greater are (Belviq) Lorcaserin hydrochloride and Qsymia (combination of phentermine and topiramate). They have to be combined with reduced calorie intake and physical activity.
- Sibutramine, fenfluramine, dexfenfluramine, rimonabant and leptin drugs are also used in the treatment of obesity.
- Weight-loss surgeries may be an option, usually as a last resort, and are only recommended in case of morbid or gross obesity for adults with a BMI of 35 or above. or for those who have a life-threatening condition.
- Vertical Banded Gastroplasty (VBG) or Stomach Stapling is a restrictive technique that uses a band to create a small pouch on the top of the stomach that limits the amount of food and liquids the stomach can hold.
- Gastric Banding is also a type of restrictive surgery which involves the use of laparoscopy to place a silicon band in the stomach. This band is adjustable and is capable of squeezing the stomach to hold about one ounce of food.
- Sleeve Gastrectomy technique is one of the most popular restrictive surgery methods which removes more than half of the part of stomach resulting in a vertical sleeve-like portion behind.
- Malabsorption technique bypasses a portion of the digestive tract to varying degrees thus reducing the absorption of calories and nutrients.

**When you conquer
Obesity,
you are protecting
yourself from
*Cancer***

